Learning experiences and anxiety sensitivity in normal adolescents

Journal of Psychopathology and Behavioral Assessment, Vol. 23, No. 4, December 2001 (© 2001)

Learning Experiences and Anxiety Sensitivity in Normal Adolescents

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The present study examined the relationships between learning experiences with respect to somatic symptoms and levels of anxiety sensitivity in youths. Fifty-two normal adolescents aged 12 to 14 years were interviewed about their learning experiences with anxiety-related and nonanxiety-related somatic symptoms and completed the Childhood Anxiety Sensitivity Index. Results showed that informational learning to some extent contributed to adolescents' anxiety sensitivity levels. That is, parents' transmission of the idea that somatic symptoms might be dangerous was significantly associated with levels of anxiety sensitivity. Other learning experiences such as parental reinforcement or observational learning were not found to be related to anxiety sensitivity. It can be concluded that learning experiences seem to play a small but significant role in the development of high levels of anxiety sensitivity.

KEY WORDS: anxiety sensitivity; learning experiences; adolescents.

Anxiety sensitivity refers to the fear of anxiety-related sensations that are interpreted as having potentially harmful somatic, psychological, or social consequences, and hence give rise to significant anxiety (e.g., Reiss, 1991). Research in both adult and child populations has provided evidence for the notion that anxiety sensitivity should be considered as a vulnerability factor to anxiety disorders, in particular panic disorder (e.g., Rachman, 1998; Silverman & Weems, 1999). As to the origins of this vulnerability factor, Reiss and McNally (1985) have posited that anxiety sensitivity could arise from either genetic factors or learning experiences or both. Interestingly, Stein, Jang, and Livesley (1999) examined the heritability of anxiety sensitivity in 179 monozygotic and 158 dizygotic twin pairs. These authors found that anxiety sensitivity has a strong heritable component, accounting for nearly half of the variance in anxiety sensitivity levels ($h^2 = .45$). However, these data also suggest that the greatest proportion of the variance in anxiety sensitivity levels (i.e., 55%) is attributable to environmental influences. More specifically, it has been suggested that childhood learning experiences play a role in the development of heightened anxiety sensitivity (e.g., Stein et al., 1999).

Recently, Watt, Stewart, and Cox (1998) investigated the role of childhood learning experiences in the development of anxiety sensitivity. A large sample of young adults participated in a retrospective assessment of their childhood and adolescent instrumental, vicarious, and informational learning experiences with respect to anxiety-related (dizziness, shortness of breath, palpitations) and nonanxiety-related (colds) somatic symptoms. More specifically, subjects were questioned about their experience with such somatic symptoms and asked to indicate (a) whether such symptoms had been accompanied by special attention from parents or whether they had received instructions to restrain from provoking situations or both (instrumental conditioning), (b) whether their parents had modeled, and were rewarded for, fear reactions to their own somatic symptoms (observational learning), and (c) whether their parents had given them the idea that the somatic symptoms might be harmful (informational learning). Anxiety sensitivity levels were assessed by means of

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0882-2689/01/1200-0279/0 © 2001 Plenum Publishing Corporation

the Anxiety Sensitivity Index (Reiss, Peterson, Gursky, & McNally, 1986). Results showed that subjects with high levels of anxiety sensitivity reported significantly more instrumental, vicarious, and informational learning experiences in relation to anxiety-related symptoms than subjects with lower levels of anxiety sensitivity. However, a similar pattern of findings emerged when examining subjects' learning experiences with respect to nonanxiety-related somatic symptoms (i.e., colds). That is, high anxiety sensitivity subjects reported more learning experiences in relation to colds than low anxiety sensitivity subjects. Altogether, these results confirm the notion that learning experiences play a role in the development of high levels of anxiety sensitivity, but also indicate that these learning experiences are not specific to anxiety-related symptoms but rather involve parental reinforcement of sick-role behavior related to somatic symptoms in general (Watt et al., 1998; see also Watt & Stewart, 2000).

The current study further examined the connection between learning experiences and anxiety sensitivity. Although previous studies have relied on retrospective accounts of adult subjects' past learning experiences with respect to somatic symptoms (Watt et al., 1998; Watt & Stewart, 2000), the present investigation examined instrumental, observational, and informational learning in youths. A small sample of normal adolescents ($N = 52$) was interviewed about their learning experiences with anxiety-related and nonanxiety-related somatic symptoms and completed the Childhood Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991) to measure their levels of anxiety sensitivity. In addition, the Diagnostic Interview Schedule for Children (DISC; National Institute of Mental Health, 1992) was administered to assess adolescents' symptoms of anxiety disorders. Administration of the DISC enabled us to test the common notion that anxiety sensitivity is related to anxiety disorders symptoms and to investigate whether there was a direct connection between learning experiences and anxiety disorders symptoms.

METHOD

Subjects and Procedure

Fifty-two adolescents aged between 12 and 14 years (23 boys and 29 girls; mean age = 12.3 years, $SD = 0.5$) were recruited from a normal secondary school. Written informed consent was obtained from parents and adolescents before participation in the study; approximately 50% of those invited agreed to participate in the study.

All subjects were tested individually in a separate room at school. First, they were interviewed with the Learning Experiences Interview (LEI), then they completed the CASI, and finally the DISC was administered.

Assessment

The LEI was based on the expanded version of Ehlers' Learning History Questionnaire (Ehlers, 1993; see Watts et al., 1998) and consisted of three parts. Part I pertained to subjects' experience of pain symptoms. Subjects were first asked what type of pain symptoms (headache, stomachache) they had most often and to indicate on a 7-point scale (anchors: 1 = *less than once per year*, 7 = *several times per week*) how frequently they suffered from that pain symptom. Then, 17 questions pertaining to their learning experiences in relation to pain were asked: 7 questions had to do with parents' reinforcement of pain symptoms (e.g., "When you have pain, do your parents allow you to stay home from school?", "When you have pain, do you receive special care, for example nice food or sweets?") and 10 questions pertained to parents' transmission of the idea that the pain symptom might be dangerous (e.g., "Do your parents warn you of the possible dangers of your pain symptoms?", "Are your parents afraid of your pain symptoms?"). Part II of the LEI was concerned with subjects' experience of anxiety-related symptoms. Subjects first had to specify which anxiety-related symptom (dizziness, shortness of breath, racing heartbeat, nausea) they had most often and to rate the frequency of that symptom on a 7-point scale. In passing, it should be noted that although such symptoms are typical for anxiety, no connection was drawn to anxiety in the instructions, as these symptoms also occur for reasons other than anxiety (e.g., asthma, allergies, flu) and every symptom occurrence was of interest (see Ehlers, 1993). Next, as in part I, 17 questions referring to learning experiences in relation to that anxiety-related symptom were asked: again 7 questions pertaining to parents' reinforcement of the symptom and 10 questions concerning parents' transmission of anxiety. Part III pertained to the observation of others' somatic symptoms. Subjects were asked whether their father, mother, or another close person suffered from either pain or anxiety-related symptoms and they were asked to answer 15 questions concerning modeling experiences of sick-role behavior: 6 questions referred to the reinforcement of symptoms (e.g., "Does he/she stay home from work when he/she suffers from these symptoms?") and 9 questions to the transmission of anxiety (e.g., "Does he/she worry about his/her symptoms?"). All questions

about learning experiences had to be answered on a 4-point scale with 0 (*never*), 1 (*sometimes*), 2 (*often*), and 3 (*always*).

The CASI is an 18-item self-report questionnaire for assessing the fear of anxiety symptoms in children and adolescents. Example items are "It scares me when my heart beats fast," "It scares me when I feel nervous," and "It scares me when I feel shaky." Children have to rate on a 3-point Likert scale (1 = *none*, 2 = *some*, 3 = *a lot*) the extent to which they believe that the experience of anxiety will have negative consequences. CASI scores range between 18 and 54, with higher scores indicating higher levels of anxiety sensitivity.

The child version of the DISC (Version 2.3) is a highly structured interview instrument designed to assess common *DSM-III-R* (American Psychiatric Association, 1987) diagnoses in children and adolescents. Previous research has shown that the instrument possesses adequate test-retest stability, sufficient interrater reliability, and acceptable validity (see Angold & Fisher, 1999). In the current study, only symptoms for the most prevalent, major anxiety disorders in youths, namely panic disorder, social phobia, separation anxiety disorder, and generalized anxiety disorder, were checked. Adolescents were asked to rate each symptom on a 3-point scale with 0 (*not present*), 1 (*sometimes present*), and 2 (*often present*). As the number of subjects was small, continuous scores were derived from the DISC rather than anxiety disorder diagnoses. That is, for each anxiety disorder, a total score was computed by summing children's ratings of symptoms.

All questionnaires were in Dutch: the translated DISC is officially published and has been shown to possess comparable psychometric properties as its English-language version (see Verhulst, Van der Ende, Ferdinand, & Kasius, 1997). The CASI[4] and the LEI were translated into Dutch by the first author. A professional translator checked and corrected the translation.

RESULTS AND DISCUSSION

Before discussing the main results of the present study, a number of general remarks should be made. First, instruments that were used possessed reasonable internal consistency. That is, 6 out of 11 scales had satisfactory Cronbach's alphas of $>.70$, alphas of the other scales were in the .60 range. Second, no substantial gender differences were found for any of the measures. Third, the mean CASI total score ($M = 27.1$, $SD = 4.8$) that was found in the present study was highly similar to that obtained in previous studies on normal adolescents of this age (e.g., Silverman et al., 1991).

LEI data showed that pain (e.g., headache: $n = 22$) and anxiety-related somatic symptoms (e.g., dizziness: $n = 13$; nausea: $n = 11$; palpitations: $n = 6$) were common experiences in this sample of normal adolescents: mean frequency ratings were 4.9 ($SD = 1.4$) and 4.9 ($SD = 1.7$), respectively, indicating that both types of symptoms occurred on average "several times per month." Furthermore, the majority of adolescents (61.5%) reported that they had observed others (e.g., mother: $n = 24$) suffering from somatic symptoms (e.g., headache: $n = 13$).

As to the connection between learning experiences and anxiety sensitivity, results showed that only parents' transmission of the idea that somatic symptoms might be dangerous (LEI "transmission of anxiety") was significantly related to CASI scores. As can be seen in Table I, this was not only the case for the experience of anxiety-related symptoms ($r = .28$), but also for the experience of pain symptoms ($r = .37$). No support was found for the notion that parental reinforcement of somatic symptoms

Table I. Mean Scores and Reliability Coefficients for CASI, DISC, and LEI, and Correlations Between Anxiety Sensitivity and Other Measures

	M (SD)	α	Anxiety sensitivity (CASI)
CASI	27.1 (4.8)	.77	
DISC			
Total score	12.3 (10.3)	.86	.55**
Panic/agoraphobia	1.7 (2.2)	.63	.33*
Social phobia	3.0 (2.9)	.68	.36**
Separation anxiety disorder	4.1 (4.2)	.76	.56**
Generalized anxiety disorder	3.5 (3.7)	.66	.40**
LEI			
Pain symptoms			
Reinforcement	6.2 (3.5)	.63	−.09
Transmission of anxiety	10.3 (4.9)	.76	.37**
Anxiety-related symptoms			
Reinforcement	6.7 (3.5)	.60	.00
Transmission of anxiety	7.1 (5.0)	.82	.28*
Someone else's somatic symptoms			
Reinforcement	5.3 (5.2)	.85	.16
Transmission of anxiety	4.2 (4.7)	.86	.14

Note. CASI: Childhood Anxiety Sensitivity Index, DISC: Diagnostic Interview Schedule for Children, LEI: Learning Experiences Interview. $N = 52$.
$^{*}p < .05$, $^{**}p < .01$.

[4]First evidence for the reliability and validity of the Dutch CASI is provided in a recent publication by Muris, Schmidt, Merckelbach, and Schouten (2001).

or the observation of someone else's responses to somatic symptoms play a role in the radicalization of anxiety sensitivity.

In keeping with the notion that anxiety sensitivity plays a role in the etiology of anxiety disorders, CASI scores were significantly associated with DISC scores (*r*s between .33 and .56; see Table I). Although previous research has indicated that anxiety sensitivity is particularly involved in panic disorder, is should be noted that in the current study the correlation between CASI and DISC panic disorder/agoraphobia was rather modest ($r = .33$). This finding was probably due to the fact that the frequency of these symptoms was relatively low in this small sample of nonreferred adolescents.

None of the correlations between LEI and DISC scores attained significance, indicating that there was no direct relationship between learning experiences and anxiety disorders symptoms (e.g., *r*s between LEI scales and DISC total score all varied between .03 and .21, nonsignificant).

In conclusion, then, the current study investigated the relationships between learning experiences and anxiety sensitivity in a sample of normal adolescents. The data suggested that informational learning to some extent contributes to adolescents' anxiety sensitivity levels. That is, parents' transmission of the idea that somatic symptoms might be dangerous was significantly associated with levels of anxiety sensitivity. Other learning experiences such as parental reinforcement or observational learning were not found to be related to anxiety sensitivity.

Note that no *specific* connections were observed between learning experiences and anxiety sensitivity. That is, a significant correlation between LEI "transmission of anxiety" and anxiety sensitivity was not only observed for anxiety-related somatic symptoms but also for pain symptoms. This result suggests that learning experiences do not need to be specific for anxiety-related symptoms, but probably involve parental confirmation of sick-role behavior related to bodily symptoms in general. In the words of Watt et al. (1998, p. 519), "the origins of heightened anxiety sensitivity levels may lie in learning to catastrophize about somatic sensations in general rather than anxiety-related symptoms in particular." From this point of view, it becomes clear why anxiety sensitivity is not only regarded as a potentially important factor for anxiety disorders such as panic disorder, but is also increasingly considered as relevant for other psychiatric disorders (e.g., hypochondriasis; Watt & Stewart, 2000) and disabling health conditions (e.g., pain; Asmundson & Norton, 1995).

It should be mentioned that the present investigation suffered from various limitations. First of all, the study relied on a sample of only 52 adolescents as the response rate to our invitation to participate was rather small (approximately 50%). Second, participants were normal adolescents aged 12–14 years and it remains to be seen whether the present findings can be replicated in children of different age groups (e.g., younger children) and clinically referred youths (including children and adolescents with anxiety disorders). Third, Cronbach's alphas of some DISC and LEI scales were rather low and thus it should be kept in mind that the pertinent scales were rather crude indexes of the constructs that they intended to measure. Fourth, the study solely relied on adolescents' self-report. Interviews with the parents could have yielded important additional information on instrumental, observational, and informational experiences through which children learn about the dangers of physical symptoms. Fifth and finally, learning models for the development of fear (e.g., Rachman, 1977) typically discuss three pathways for developing fear: direct classical conditioning, observational learning, and informational learning. The current study investigated two of these pathways (i.e., observational and informational learning) as well as instrumental learning. Thus, direct classical conditioning was neglected, although this pathway may certainly play a role in the development of anxiety sensitivity. Future research should attempt to include this type of learning, for example, by asking children whether they (have) suffer(ed) from a serious illness. Despite these shortcomings, the current results are in keeping with findings from previous retrospective studies (Watt et al., 1998; Watt & Stewart, 2000) showing that learning experiences play a small but significant role in the development of high levels of anxiety sensitivity which in turn may increase subjects' vulnerability to anxiety disorders, hypochondriasis, and probably somatoform disorders.

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